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McKinsey High Tech, Media & Telecoms Practice

November 2013

Lions go digital: The Internet's transformative potential in Africa

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The Internet in Africa today …

16%
Internet penetration

167 million
Internet users

67 million
smartphones

>50%
of urban residents are online

51.6 million
Facebook users

$18 billion
Internet contribution to GDP

… and its potential by 2025

~50%
Internet penetration

600 million
Internet users

360 million
smartphones

$75 billion
in annual e-commerce sales

$300 billion
Internet contribution to GDP

~$300 billion
productivity gains in key sectors

Executive summary

Lions on the move: The progress and potential of African economies, our 2010 report on Africa's rising economies, described a continent in transition, with urbanisation and the rise of the middle-class consumer fuelling growth. Today, following a decade of economic expansion, Africa is going digital. Only 16 percent of the continent's one billion people are online, but that share is rising rapidly as mobile networks are built out and the cost of Internet-capable devices continues to fall.[1] More than 720 million Africans have mobile phones, some 167 million already use the Internet, and 52 million are on Facebook.[2]

Evidence of what is to come can already be seen in Africa's major cities, where consumers have disposable income, more than half have Internet-capable devices, and 3G networks are up and running. There is a growing wave of innovation as entrepreneurs and large corporations alike launch Web-based ventures, from e-commerce sites and digital entertainment platforms to mobile health technologies and online educational content. Governments have placed Internet-driven growth firmly on the agenda: Rwanda, Morocco, and Nigeria, for example, have ambitious plans to expand high-speed Internet access to most of their populations. Most countries have developed national information and communication technologies (ICT) strategies, but many are still in the early stages of implementation.

Today, the Internet's contribution to Africa's GDP remains low, at 1.1 percent—just over half the levels seen in other emerging markets and well below the average of 3.7 percent in developed economies. This figure varies widely across individual countries, from 0.6 percent in Ethiopia to 3.3 percent in Senegal.

But the Internet is likely to take hold on a much larger scale in the coming decade, and previous research has found that its impact is magnified in emerging countries.[3] Mobile telephony has already had an outsized effect in Africa as it connected people who previously had little or no access to telecommunications due to the scarcity of fixed-line infrastructure. If the Internet matches or exceeds that level of impact, the result could be a leap forward in Africa's economic growth and development. Assuming a similar multiplier effect, the Internet could contribute some $300 billion to Africa's GDP by 2025 (see Box 1, "Why the Internet matters").

1 *Measuring the information society 2013,* International Telecommunications Union.

2 International Telecommunications Union statistical database, 2012; Internet World Stats for 2012.

3 *Online and upcoming: The Internet's impact in aspiring countries,* McKinsey & Company High Tech Practice, January 2012.

Box 1. Why the Internet matters

The Internet is a catalyst for economic growth. Previous MGI research found that it has contributed more than 10 percent of total GDP growth over the past five years in China, India, and Brazil, and its impact is accelerating. An increase in a country's Internet maturity correlates with a sizable increase in real per capita GDP.[1]

As countries go online, they realise efficiencies in the delivery of public services and the operations of large and small businesses alike. The benefits of Internet-driven productivity gains are not limited to Web-based companies: among small and medium-sized enterprises (SMEs), 75 percent of the economic impact of the Internet has accrued to companies that are not pure Internet players. In a global survey of 4,800 SMEs, McKinsey found that across all sectors, companies utilising Web technologies grew more than twice as fast as those with a minimal online presence, generating more revenue through exports and creating more jobs.

The Internet also creates tremendous value for consumers. Online prices are, on average, around 10 percent lower than offline prices as a result of the transparency provided by search tools, generating tens of billions of dollars of consumer surplus in the nations with the widest Internet use.

Above all, the Internet will enable Africans to keep in contact with friends, relatives, and customers; access public information and services; manage their health; and advance their education. As Africa grows more connected, millions will tap into information and opportunities that were once beyond their reach. They will gain a greater voice in their communities and enrich the world's flow of commerce and ideas.

1 *The great transformer: The impact of the Internet on economic growth and prosperity*, McKinsey Global Institute, October 2011.

The Internet will generate economic growth and social transformation in six sectors in particular: financial services, education, health, retail, agriculture, and government. In financial services, for example, M-Pesa's mobile money solutions have brought millions of Kenyans onto the financial grid for the first time. Remote diagnostics are expanding medical services to rural areas that have few health-care professionals. Students are beginning to learn with new digital education tools, and e-government initiatives are connecting citizens with services.

This report examines the progress and potential of the Internet in 14 economies that together make up 90 percent of Africa's GDP. In addition to measuring the size of their current Internet economies, it evaluates the strength of five fundamental pillars of Internet readiness: national ICT strategy, infrastructure, business environment, access to financial capital, and the development of ICT-related human capital. By combining these factors, it is possible to map each country's progress on its digital journey. (Kenya and Senegal, for instance, are not Africa's largest economies, but they have nevertheless emerged as the continent's leaders in terms of the relative economic contribution of the Internet.) This benchmarking provides a framework for understanding the paths that can be taken by the public and private sectors to build a robust Internet economy and capture the Internet's full potential.

TAKING STOCK OF THE INTERNET IN AFRICA TODAY

Indicators for Internet penetration and usage reveal significant variations across our sample countries (Exhibit E1). And while Internet penetration is just over 16 percent across the continent as a whole, it is much higher in urban areas,

where more than 50 percent of residents use the Internet regularly (Exhibit E2). A recent McKinsey report found that 25 percent of urban Africans go online daily, led by Kenyans at 47 percent and Senegalese at 34 percent.[4]

Exhibit E1

Penetration and usage vary widely across the continent

Internet penetration and usage, 2012

	Mobile penetration[1] % of population	Internet penetration % of population	Urban internet penetration % of population	Facebook users Million	Online retail penetration %	High-speed Internet penetration[2] % of population	Internet use within companies Index, 0–7	Government departments online %	Government information systems online %
Algeria	103	14	52	4.1	0.39	2.5	3.1	10	1
Angola	49	15	49	0.6	0.49	0.1	3.4	34	7
Cameroon	64	5	–	0.6	0.01	0	4.6	15	16
Côte d'Ivoire	96	4	–	–	–	0	3.9	32	17
Egypt	115	36	46	12.2	0.37	1.8	4.6	53	29
Ethiopia	24	1	47	0.9	0.40	0.8	3.6	20	4
Ghana	100	14	55	1.6	0.43	0.2	4.5	15	9
Kenya	72	28	78	2.0	0.73	0	5.0	24	23
Morocco	120	51	52	5.1	0.50	1.6	4.5	24	13
Mozambique	33	4	–	0.4	–	0.1	4.5	17	11
Nigeria	68	28	50	6.6	0.04	0.1	4.5	10	1
Senegal	88	18	70	0.7	0.44	0.6	5.3	18	3
South Africa	135	17	54	6.3	0.49	1.5	5.3	31	19
Tanzania	57	12	–	0.7	–	0	3.8	17	4

1 Not adjusted for multi-SIMming, i.e., individuals may own more than one SIM card and be counted multiple times.
2 Fixed line only.
SOURCE: Internet World Stats; International Telecommunications Union statistical database, 2012; World Economic Forum Global information technology report 2012; Euromonitor; World Economic Forum Global competitiveness report; McKinsey Global Institute analysis

Exhibit E2

Africa's major cities are embracing the Internet

Among urban residents …

51%
have accessed the Internet in the last month

25%
are online daily

21%
spend more than 10 hours per week online

54%
own Internet-capable devices

57%
of Internet users use social networking sites often

SOURCE: McKinsey Africa Consumer Insights Center survey, 2012; McKinsey Global Institute analysis

4 *The rise of the African consumer*, McKinsey & Company, October 2012.

Significant investments have been made in recent years to build out backbone infrastructure and roll out 3G networks, allowing millions of Africans to connect for the first time. The continent is also in a better position in terms of international bandwidth, as capacity has been added faster than peak demand has grown. But download speeds are slow, there are very few secure Internet servers in most countries, and the cost of bandwidth remains high.

Expanding the Internet's reach across a continent characterised by vast distances and many rural villages is a formidable challenge, but in overcoming these constraints, Africa could eventually join the forefront of the next wave of mobile data innovation. Providing Internet access will also become easier to deliver as Africa's urbanisation rate rises from 40 percent today to 50 percent by 2030.

In terms of economic impact, however, the Internet has yet to produce the same level of contributions in Africa as seen in a sample of major emerging and developed economies. Our analysis shows that the Internet accounts for just 1.1 percent of GDP across our sample of 14 African economies in 2012—just over half its share in other major emerging countries and less than a third of the average in major developed countries.[5]

McKinsey has developed the concept of iGDP as a way to measure the Internet's contribution to the overall economy as a share of total GDP.[6] It totals all the activities linked to the creation and use of Internet networks and services in four major categories: private consumption, public expenditure, private investment, and trade balance. This iGDP approach allows us to make comparisons across countries using national accounts data and the directly measurable parts of economies. We assessed 14 countries that together account for 90 percent of Africa's GDP and found significant variation among them (Exhibit E3). Senegal's iGDP stands at 3.3 percent and Kenya's at 2.9 percent—levels comparable to those of France and Germany. By contrast, the continent's largest economies, South Africa and Nigeria, have iGDPs of 1.4 percent and 0.8 percent, respectively.[7] This suggests that there are major untapped opportunities to harness the power of the Internet to drive growth and development.

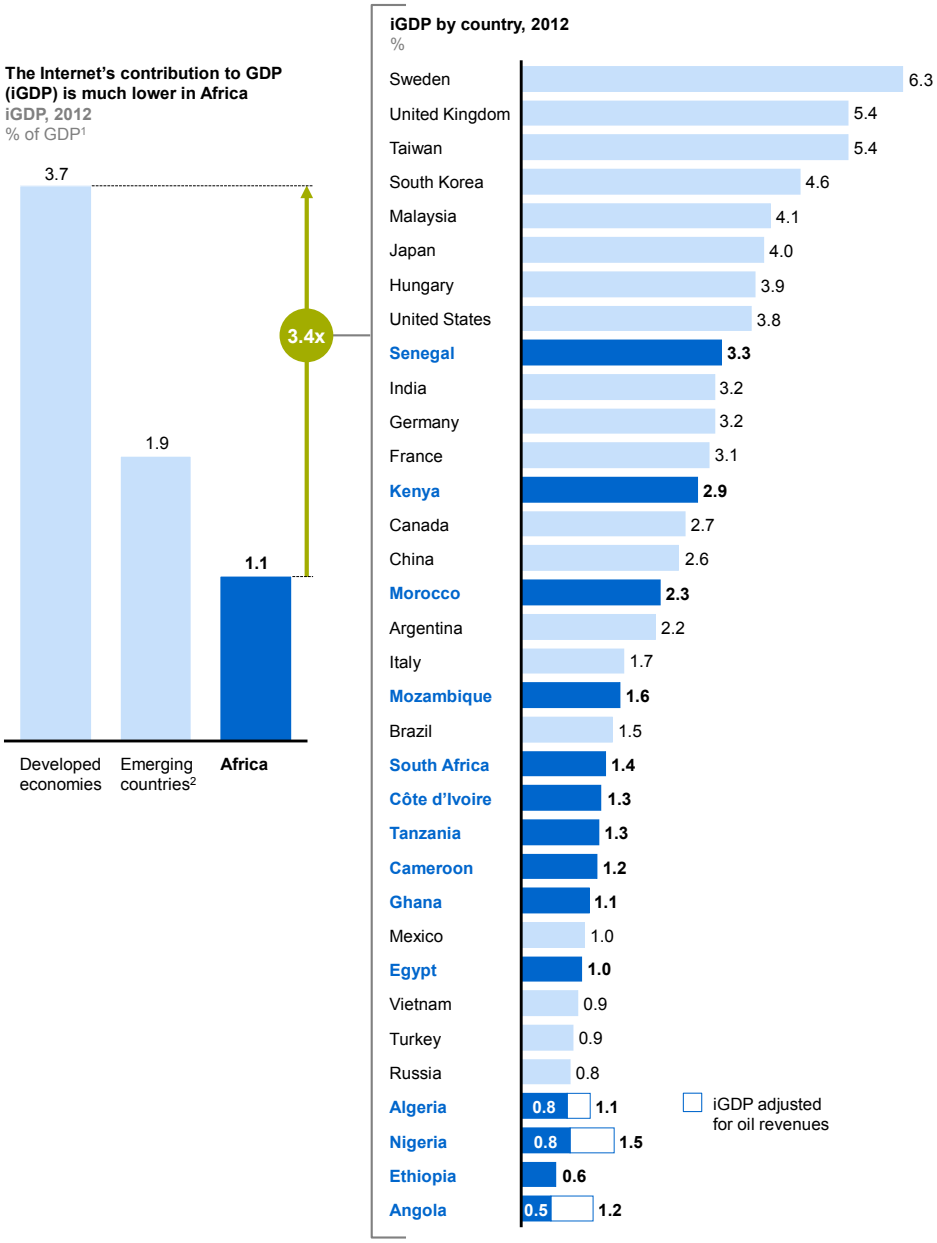
It is important to note, however, that the relative drivers of iGDP are different for each country (Exhibit E4). For example, Kenya's iGDP is dominated by private consumption, while the largest component of Morocco's iGDP is a trade surplus resulting from its business process outsourcing (BPO) industry. There is no single path to success; individual countries will capitalise on their own particular strengths and opportunities.

5 The sample of emerging countries used for this comparison includes Argentina, Brazil, China, India, Malaysia, Mexico, and Turkey. The sample of developed economies includes Canada, France, Germany, Hungary, Japan, Sweden, the United Kingdom, Taiwan, and the United States.

6 See the appendix of this report for further details on the methology. We have previously used this approach to measure the impact of the Internet on advanced economies (see *Internet matters: The Net's sweeping impact on growth, jobs, and prosperity*, May 2011) as well as emerging economies (*Online and upcoming: The Internet's impact in aspiring countries*, January 2012).

7 Note that Nigeria's iGDP rises to 1.53 percent when its GDP figure is adjusted to account for the impact of oil revenue.

Exhibit E3
Senegal and Kenya are leading the way on the continent



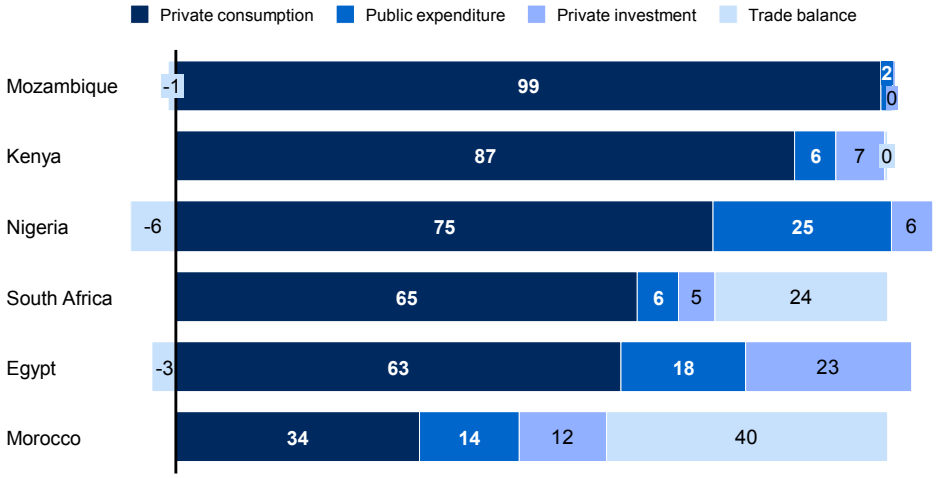
1 GDP assessed by expenditure method, with a share of each category attributed to the Internet.
2 Aspiring countries data is from 2010.

SOURCE: Gartner; IHS Global Insight; Organisation for Economic Co-operation and Development; International Telecommunication Union; International Data Corporation; World Health Organization; ICD; iConsumer US 2012; Euromonitor; H2 Gambling Capital; PhoCusWright; Pyramid Research; UNESCO (United Nations Educational, Scientific and Cultural Organization); McKinsey Global Institute analysis

Exhibit E4

The relative drivers of iGDP vary by country

%



NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute analysis

In dollar terms, the 2012 iGDP for the 14 countries we studied is $17.7 billion, which is 1.1 percent of their total GDP. (Since these countries represent 90 percent of Africa's GDP, they account for the vast majority of its iGDP as well. We estimate iGDP for the entire continent to be in the range of $18 billion to $18.5 billion.[8]) Private consumption of Internet-related services and equipment, including smartphones, accounts for two-thirds of this total. Public expenditure on the Internet, including digitisation of education and health services, contributes only 11 percent to iGDP. Private investment in infrastructure and digitisation accounts for a further 9 percent, while the remainder is a positive trade balance created by BPO services.

THE LEAPFROG OPPORTUNITY AND ITS DRIVERS

To put the Internet's potential for Africa in perspective, it is helpful to consider the impact of the mobile phone, which has revolutionised the way individuals interact and the way SMEs, farmers, and informal traders operate. As a result, mobile revenue is equivalent to 3.7 percent of GDP in Africa, more than triple its share in developed economies, where it was an incremental innovation

The Internet's effects could be similarly magnified in Africa. Despite the fact that Africa's iGDP is currently lower than that of other regions, our analysis suggests that the Internet will take hold on a much larger scale in the coming decade—and as it does, it could provide new solutions to some of Africa's major social challenges.

In a baseline scenario, Africa's iGDP could grow to at least 5 to 6 percent of GDP, matching that of leading economies such as Taiwan, the United Kingdom, and Sweden. However, if the Internet achieves impact on the same scale as mobile telephony in Africa, iGDP could account for as much as 10 percent of total GDP by 2025—or some $300 billion.

8 This estimate assumes the iGDP for the African countries not included in our sample is 0.2 to 1 percent.

In this leapfrog scenario, increased Internet penetration and use could propel private consumption almost 13 times higher than current levels of $12 billion, reaching some $154 billion by 2025. The amount spent on Internet access and use alone could increase from $5.7 billion today to $35 billion in 2025. If 10 percent of retail spending in Africa's largest economies were to move online, e-commerce activity could result in revenue of $75 billion.

Today, public expenditure on the Internet is approximately $2 billion, which translates into just under $3 per capita. If governments implement their national ICT strategies, move a number of services online, and introduce digital health and education initiatives, this could increase to $60 billion, or $50 per capita. This potential jump would exceed Brazil's current spending ($32 per capita) but would remain significantly below levels in developed countries. In order to deliver on their strategies, governments may need to redirect some of their existing spending and generate additional funds for incremental expenditure.

With telecom operators rapidly rolling out coverage and companies across all sectors digitising operations, private Internet investment could potentially reach $62 billion annually by 2025. Africa's private-sector ICT investment could rise from a low base of $2.45 per capita today to some $52 per capita (lower than Argentina and Taiwan today).

Given levels of pent-up demand and the current pace of innovation, Africa's iGDP could catch up very quickly with that of countries in which the Internet has the most impact. There is already a groundswell of activity paving the way towards a future in which digital payments displace cash, consumers shop online, students use personalised learning tools, and doctors connect with patients in rural villages. To sustain this momentum, however, governments and the private sector will need to ensure that the foundations are in place to support demand and continue this wave of innovation. Increasing access, developing a workforce with ICT skills, and improving digital literacy in the broader population will be critical for the future growth of the Internet.

Burgeoning demand and booming private consumption

Africa is the world's most youthful continent, with more than 200 million people between the ages of 15 and 25—the cohort that uses technology the most. This demographic shift will create millions of new Internet users in the coming decade. And as Africa continues to urbanise, incomes are rising. Some 128 million households are projected to have significant discretionary income by 2020.[9]

More than half of urban African consumers already have Internet-capable devices. Basic smartphones have already fallen below the "tipping point" of $100 per unit, and as a result, Africa's smartphone penetration could rise from 2 to 5 percent today to 50 percent in leading countries and 30 percent overall. This translates into 300 million new smartphones being sold in Africa in the decade ahead. PC, laptop, and tablet penetration could double to 40 percent, again equating to nearly 300 million additional devices sold. Continued growth will be driven by falling costs and the introduction of durable, affordable products such as Veda laptops, Netsurfer tablets, and Mi-Fone and VMK mobile phones.

9 See *Lions on the move: The progress and potential of African economies*, McKinsey Global Institute, June 2010. The report estimates that incomes for 128 million households will exceed $5,000 (measured in purchasing power parity). This is the level of which households start spending roughly half their income on items other than food.

Bold initiatives and big investments by government and business

Demand is also being driven by government ICT strategies. Many countries are moving processes such as benefit payments, tax filing, and passport applications online, and efforts are gearing up to digitise education, health, and public services.

Ambitious ICT infrastructure is being planned across the continent, such as Maroc Telecom's $1.2 billion investment to upgrade its network and install fibre optics across Morocco. Undersea cable systems are being expanded, and high-speed 4G networks are being planned. Unitel, for example, is investing $1.35 billion through 2015 to modernise its network in Angola, and Smile Telecoms is rolling out 4G coverage in multiple countries. Morocco, Nigeria, and Rwanda are implementing plans to provide most of their populations with high-speed Internet access.

Large businesses and institutions are beginning to exploit the Internet to reduce costs and increase sales. The airline industry is embracing online check-in and e-ticketing, for instance, while banks are promoting online services and developing mobile microfinance products.

Growing trade

Business process outsourcing, software development, and local hardware manufacturing could all contribute to increasing Africa's trade balance (which is currently positive and could grow to $13 billion). In South Africa, BPO already generates more than $1.5 billion in revenue and accounts for 54,000 direct jobs, while Morocco's BPO sector is at similar scale. Ghana, Kenya, Nigeria, and Senegal are among the countries with plans and potential to build their own BPO sectors. Some low-cost devices are already being manufactured on the continent, particularly in Nigeria and South Africa, and there are a number of software development hubs.

A wave of innovation and entrepreneurship

As the Internet expands across Africa, it has become a launching pad for a new generation of digital entrepreneurs. In Nigeria alone, Konga and Jumia have become major online retailers, Paga is emerging as a key player in mobile payments, and Jobberman has created a digital marketplace for employers and job seekers. In Mozambique, a startup called moWoza has created a more efficient supply chain by using text messaging and a smartphone app to deploy available taxi drivers to deliver parcels from wholesalers to informal traders. Elsewhere, Mi-Fone has sold more than a million low-cost mobile phones across the continent, and ReKindle Learning, a South African startup, is developing personalised, interactive learning tools that work on simple mobile devices. For the first time, there could be effective content aggregation on the continent, driven by the likes of iROKOtv, a digital delivery platform for locally produced content.

Success stories like these are attracting global investors and spurring the formation of local angel investor and venture capital networks. Incubators are also springing up across the continent, from Kenya's iHub to South Africa's JoziHub to Cameroon's ActivSpaces. Nigeria has produced two notable examples: the Co-Creation Hub (or CcHub) and the Wennovation Hub. Microsoft recently

announced a partnership with three leading African incubators to support startups. Many of Africa's startups are not just focused on local opportunities but are "micro-multinationals" (that is, small businesses utilising technology and the Internet to access customers and suppliers globally).

CAPTURING GROWTH AND PRODUCTIVITY GAINS IN SIX SECTORS

The largest economic and social impact of the Internet is likely to be concentrated in six sectors: financial services, education, health, retail, agriculture, and government. These sectors face specific service delivery challenges, information asymmetries, or market gaps that can be bridged through the use of Internet technologies. They also stand out because of the size of the population that could benefit from these innovations. Technology-related productivity gains in these sectors could reach $148 billion to $318 billion by 2025. As costs are reduced, companies and organisations can extend products and services to populations that were excluded in the past. A number of exciting innovations are already unfolding in each of these sectors.

Financial services

Despite the inroads made in mobile payments and money solutions in recent years (most notably by Kenya's M-Pesa), more than three-quarters of adults in sub-Saharan Africa still lack accounts at formal financial institutions. But the Internet is likely to be a huge accelerator of financial inclusion as it reduces transaction costs and brings financial services to people who may live far from the nearest bank branch or ATM.

With the right technology solutions in place, more than 60 percent of Africans could have access to banking services by 2025, and more than 90 percent could use mobile wallets for daily transactions and remittances. Revenue from mobile financial services could increase from less than $1 billion today to $19 billion in 2025. In addition to increased revenue, productivity gains in the sector are estimated to be $8 billion to $10 billion.

To realise this growth, mobile money operators will need to scale up mobile payments in countries where they have not been widely adopted and ensure interoperability across each country and across borders. Companies can also begin to deliver a fuller range of banking options—including micro-savings, micro-credit, and micro-insurance products—online and on phones.

Education

The goal of delivering a high-quality education to every child in Africa remains unfulfilled. But new digital tools have the potential to deliver rapid gains in access to education, teacher training, and learning outcomes. Students who once had few textbooks can log on and learn with the world's best educational content on affordable tablets or e-books, while teachers will have access to better training. Education spending accounts for a sizeable portion of most government budgets, and now Web-based school management systems and online testing can support standardisation and monitoring of school performance that will make this public expenditure more effective.

These innovations can reach classrooms across the continent if governments, non-profits, and the private sector work together to obtain parent and teacher buy-in, deliver affordable smart devices, build ICT skills among teachers, and overcome infrastructure limitations (including connectivity and power). The technology-related productivity gains in education could reach $30 billion to almost $70 billion—enabling governments to achieve more with their education budgets and providing millions of students with the foundation for a better future.

Health

Today, Africa has only 1.1 doctors and 2.7 nurses per 1,000 people, and many people travel long distances for treatment and care. The Internet could also improve the efficiency of health spending—reducing the cost of treating chronic disease by 10 to 20 percent, reducing drug counterfeiting by 80 percent or more, and saving nurses' time. In fact, technology-related benefits for health care are estimated to be $84 billion to $188 billion. The investment in these systems will itself represent a significant contribution to iGDP—but the broader social and economic impact of improved health outcomes will be far greater.

Remote diagnostics and telemedicine could address 80 percent of the health issues of patients in rural clinics, which are typically the most poorly staffed, thereby revolutionising health care for large portions of the population while reducing costs and travel time. The Internet will enable widespread automation and centralisation of patient admissions, health records, and supply chains in public health systems and private hospitals. It also paves the way to advances in practitioner education and training.

Retail

Today, the formal retail sector is relatively underdeveloped across most of the continent, outside of South Africa. But e-commerce will open up a new shopping experience for Africa's growing middle class, giving consumers access to more choice, better quality and convenience, and lower prices, while possibly unlocking incremental demand.[10] By 2025, e-commerce could account for 10 percent of retail sales in Africa's largest economies, which would translate into some $75 billion in annual online sales. At the same time, the Internet will enable substantial productivity and efficiency gains, including cost savings, strengthened supply chains, and digitised payment collection. Technology-related productivity gains in this sector are estimated to be $16 billion to $23 billion.

E-commerce allows entrepreneurs and SMEs to connect with a large customer base and scale up rapidly. Examples on the continent include Zando, Jumia, and Konga. E-commerce also creates opportunities for "last-mile" logistics companies, as well as other support services such as payments. Paga, a Nigerian startup, offers a variety of mobile payment solutions, from SMS and a mobile app to online payments.

10 *China's e-tail revolution: Online shopping as a catalyst for growth,* McKinsey Global Institute, March 2013.

Agriculture

Growth from agriculture is at least twice as effective in reducing poverty as growth in other sectors.[11] Huge efforts are under way across the continent to grow agriculture's output, value, and social impact—and the Internet has the potential to accelerate those efforts. It can connect farmers with expertise and information on everything from weather, crop selection, and pest control to management and finance. It can also improve their access to markets and increase their pricing power. As they go online, agricultural exchanges are growing in breadth and sophistication; the East Africa Exchange, for example, provides a virtual trading platform as well as support services and market intelligence. Nigeria has used mobile technology to revamp its system for delivering fertiliser subsidies. Its "e-wallet" programme has already achieved major savings, eliminated opportunities for corruption, expanded the number of farmers served, and far exceeded its production targets. Internet technology can drive up to $3 billion in annual productivity gains in the sector.

Government

The Internet is a powerful tool to improve transparency, provide citizens with access to information, and automate revenue collection. By 2025, half or more of all government departments in Africa could have automated information systems—and all customer-facing government departments could have an online presence, allowing citizens to access services at the touch of a button. Potential technology-related productivity gains in government are estimated to be $10 billion to $25 billion, enabling more effective service delivery.

ASSESSING EACH COUNTRY'S PATH

To develop a strong Internet ecosystem, public and private attention must be focused on both supply and demand. Infrastructure is critical and usually receives the bulk of public and private investment, but there are other important components of a healthy and vibrant system. For a country to unlock the Internet's full economic potential, five pillars must be in place: national ICT strategy; infrastructure; a healthy business environment; financial capital; and human capital with the requisite technology skills. McKinsey has developed the Internet Foundations Index (i5F) to measure the strength of these pillars. This score is an indicator of Internet "readiness" that correlates closely with economic impact in the form of iGDP.

We analysed a sample of 14 countries that together account for 90 percent of Africa's GDP.[12] The average i5F score for the sample is 37 percent, which compares to 50 percent for leading emerging economies and 66 percent for developed economies.[13]

11 *Agriculture sector strategy 2010–2014,* African Development Bank Group, January 2010; *World development report 2008: Agriculture for development*, World Bank.

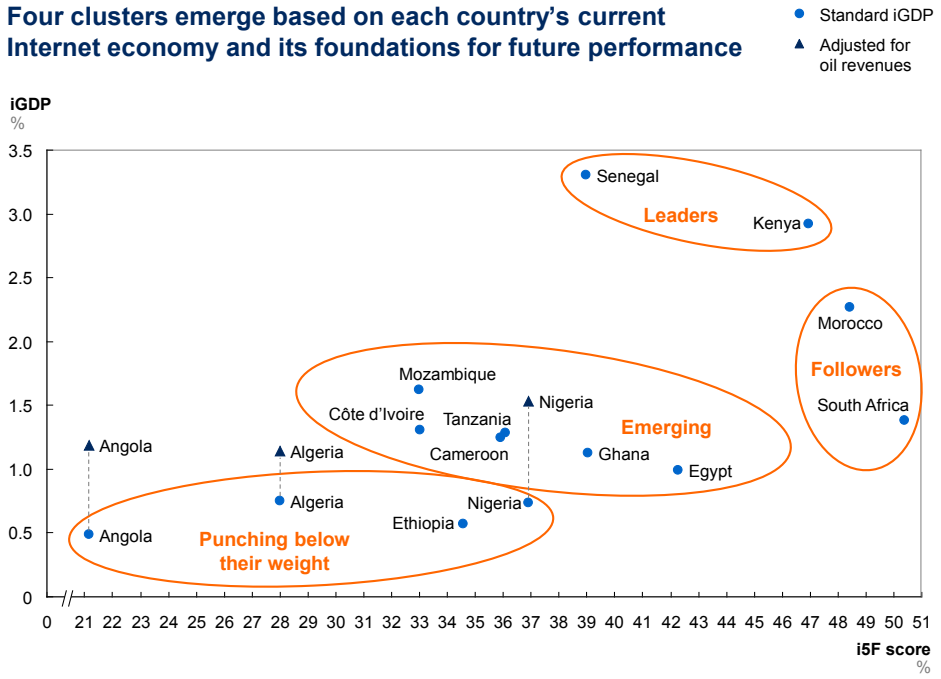
12 Countries included in the sample have populations exceeding 12 million, GDP exceeding $12 billion, and GDP per capita exceeding $500.

13 The emerging economies in this sample are Argentina, Brazil, China, India, Malaysia, Mexico, and Turkey. The developed economies are Canada, France, Germany, Hungary, Italy, Japan, Sweden, the United Kingdom, and the United States.

Mapping each country's iGDP against its i5F score yields four clusters of countries, indicating their relative levels of Internet development (Exhibit E5). It reveals that some countries are much further along the path of Internet-driven growth than others. The specific steps needed to unlock the Internet's economic development potential vary considerably depending on these starting points.

Exhibit E5

Four clusters emerge based on each country's current Internet economy and its foundations for future performance



SOURCE: McKinsey Global Institute analysis

Leaders: Kenya and Senegal

Among our sample of 14 African countries, the two nations with the largest iGDP (or share of the Internet's contribution to GDP) are Senegal and Kenya. This is perhaps a counterintuitive finding, as they are not the continent's largest economies. But both governments have made it a priority to stimulate Internet demand and have therefore driven private consumption, which accounts for more than 85 percent of iGDP in each country.

It is worth noting that Kenya and Senegal do not lead the sample in overall i5F scores, but their high scores on the dimension of national ICT strategy alone could have been the impetus for their iGDP today. Senegal's government, for instance, was one of the first on the continent to invest in fibre-optic infrastructure and prioritise the rollout of Internet cafés. Its e-government project has directed resources to digitising education, public administration, and health-care services.

Even though Senegal has a higher iGDP today, Kenya may be better positioned for the future, given its trade surplus (0.3 as a percentage of GDP) and its track record of working closely with the private sector to drive investment. Kenya's ICT board is focused on implementing a long-term national vision, facilitating investment, and encouraging innovation in both the private and public sectors.

To maintain their current lead, however, both countries will need to improve their infrastructure and cultivate a workforce with ICT skills. Senegal could also benefit from focusing on access to capital. These priorities could make iGDP in both countries less dependent on private consumption and more in line with the iGDP of developed countries.

Followers: Morocco and South Africa

Morocco and South Africa lag behind Kenya and Senegal in terms of iGDP, with lower contributions from private consumption. But Morocco and South Africa are the leaders in trade surplus, thanks to strong business process outsourcing industries, and have a higher contribution from public expenditure and private investment. Morocco's slightly better performance could be explained by its higher levels of private investment and public expenditure, and thus better infrastructure.

Morocco and South Africa could become future leaders on the continent, as they lead the sample in terms of i5F scores, with particularly strong showings for business environment and financial capital. The presence of these building blocks indicates the potential for future growth. Already Morocco has the highest Internet penetration in Africa (and recently announced a 10-year plan to create universal broadband access), while preliminary 2013 data indicate that South Africa's Internet adoption is rapidly accelerating. To fully leverage these advantages, both countries may need to strengthen infrastructure, cultivate ICT skills in their workforce, and sharpen their national ICT strategies.

Emerging: Cameroon, Côte d'Ivoire, Egypt, Ghana, Mozambique, and Tanzania

Apart from Mozambique (1.6 percent), these countries post iGDPs of 1.3 percent or lower. Private consumption accounts for more than 90 percent of iGDP, except in the cases of Ghana (86 percent) and Egypt (63 percent). Egypt stands out in terms of private investment and public expenditure in per capita terms (although there is room to increase both as a percentage of GDP). Overall, these countries currently have weak foundations for Internet growth, but there is potential for more coordinated national ICT strategies to change this picture by building on the relative strength of their business environments.

Punching below their weight: Algeria, Angola, Ethiopia, and Nigeria

In these countries, the Internet contributes less than 1 percent of GDP. However, the composition of iGDP is very different in Ethiopia, which is a pre-transition economy, than in Angola, Nigeria, and Algeria, which are resource-rich economies. In Ethiopia, private consumption accounts for 98 percent of iGDP, while in the other countries, private investment and public expenditure play bigger roles.

Furthermore, if we adjust the GDP figures for Angola, Algeria, and Nigeria to account for the somewhat distorting factor of oil revenue, their iGDP would increase to 1 to 1.5 percent. These countries also tend to have low i5F scores, however. The question they face is whether they could direct resource revenue to drive public expenditure and private investment to build their ICT sectors and broaden economic development.

UNLOCKING THE INTERNET'S FULL POTENTIAL

The specific actions that countries need to take depend on their current situation, but across the board, there is a need to strengthen the foundations of human capital and infrastructure. There are several specific areas of action for African policy makers and business leaders.

Government initiatives

All 14 countries in our sample have singled out Internet development as a priority, but not all have been systematic in their approaches or successful in translating their goals into GDP impact. In the i5F index, most countries scored above 40 percent for national ICT strategy, but the leaders on this dimension were Senegal (68 percent) and Kenya (59 percent), pointing to the important role that government can play in developing the ICT sector on the continent.

In our view, there are five key elements that determine a government's ability to successfully support the development of the Internet. These include a coordinated national vision, driven by a strong champion who may take on a role similar to that of a chief information officer; collaboration with the private sector; a strategy for generating demand; support for expanding access; and a commitment to building ICT capabilities.

In addition, governments will need to allocate resources and funding to implement their ICT strategies effectively. Potential sources of funding include increased revenue collection as a result of e-filing, productivity gains from digitising government processes, or redirecting existing spending as services migrate (for example, replacing spending on textbooks with spending on e-readers and online content).

Private-sector opportunities

The growth of the Internet in Africa opens the door for established companies to expand their reach and add new business lines. But the competitive dynamics are intensifying. The Internet gives startups the ability to scale up rapidly, and some may be sources of low-cost innovation that can disrupt entire industries.

In addition, multinationals increasingly realise that Africa's growing Internet penetration presents an opportunity to reach untapped markets. If local companies do not innovate quickly, they could lose out to multinationals that import solutions. For foreign companies, the challenge will be tailoring their offerings to the needs of Africa's diverse markets and competing with businesses that understand the local context and how to operate in it. It will be important to spot gaps in the market and move decisively, as first movers are likely to gain a significant advantage.

Large telecom operators will need to prepare for a pronounced migration from voice to data. They can create consumer demand by pushing for low-end smartphones, providing transparent entry-level pricing, improving the network experience, educating customers on the utility of the Internet, and ensuring that setup is hassle-free. In addition, there will be opportunities to leverage the mobile network to deliver ICT services to business customers.

More broadly, telecom operators and technology companies can partner with governments or with other enterprises to drive the digital revolution. Public-private partnerships could make strides in delivering infrastructure, developing ICT capabilities, or delivering e-government, education, and health services. Companies from different sectors may need to collaborate to deliver new products and services: banks and telecom operators have partnered to provide mobile financial services, for instance, while e-commerce depends on cooperation from multiple players to set standards, create payment platforms, and develop logistics.

Entrepreneurs are an important force in the Internet ecosystem, and they have a number of opportunities within the ICT sector and across the broader economy. But while the Internet dramatically reduces the time and cost of launching a new enterprise, the key to success is building a compelling value proposition and a well-crafted market entry strategy. To navigate these challenges and access funding, entrepreneurs can turn to the networks and support structures that are emerging across the continent, including incubator hubs and angel networks, as Africa builds its tech community.

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Despite a slow start, Africa's digital development is now accelerating. As the continent grows more connected, it is already producing innovative Web-based applications and dynamic new business models. Today Africa still lags behind other regions, but if it can bring Internet-related investment, adoption, and use up to the levels of other regions, the prize will be huge. For now, the Internet in Africa remains a wide-open space where companies and entrepreneurs can capture large opportunities if they are willing to move rapidly and decisively. And most exciting of all are the possibilities for using the Internet to revamp the delivery of education, health, and other public services—transforming lives in the process.

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